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Interoperability: treat the disease, not the symptom

Pearson, Brian Davis

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THESIS

INTEROPERABILITY: TREAT THE DISEASE,
NOT THE SYMPTOM

by

Brian Davis Pearson

June 1995

Thesis Advisor: Patrick Parker

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Interoperability:
Treat the Disease,
Not the Symptom

by

Brian D. Pearson
Lieutenant, United States Navy
B.S., United States Naval Academy

Submitted in partial fulfillment
of the requirements for the degree of

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Author: _____
Brian D. Pearson

Approved by: _____
Patrick Parker, Thesis Advisor

_____
James Wirtz, Second Reader

_____
Thomas Bruneau, Chairman
Department of National Secuirty Affairs

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ABSTRACT

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EXECUTIVE SUMMARY

As joint operations become a larger part of U.S. military operations, the ability of the armed forces to conduct them effectively becomes more important. Interoperability, the capability of forces from one service to operate effectively with forces from other services, has become a required capability of the armed forces. Past joint operations have had mixed success, and those that succeeded often repeated problems experienced in previous conflicts. An increasingly risk-averse Congress, and the public they represent, will be less tolerant of such initial growing pains in future joint operations. This thesis surveys past joint operations and uses basic psychological and sociological concepts to present an alternate explanation for interoperability problems and to propose possible solutions for those problems.

Several defense reorganizations during this century focused on inadequate command structures as the main impediment to interoperability. None were entirely successful because their reliance on command structure only treated a symptom of the actual problem: the historical lack of interaction between the services. "Interaction" refers to military activity where more than one service operates in concert toward a common objective. Interaction includes, but is not limited to, joint combat operations. It also includes activities where one service provides administrative, logistic, or other support to another service, or activities where two services have overlapping responsibilities.

Statutory divisions produced autonomous services, and separate missions

caused a lack of interaction. These factors caused the services to evolve separately. The different experiences of each service, explained by different philosophies, created separate service cultures. Separate service cultures produced two main effects.

- First, the separate philosophies of the services meant that they did not always agree on campaign goals. If the individual service commanders could not agree, cooperation would not occur. This was perceived as the actual problem, and was, therefore, the focus of efforts to improve interoperability during and after World War II.

- Second, the service staffs designed equipment and procedures to accomplish their individual missions with little regard for operations with the other services. In many cases, this produced coincidentally incompatible procedures and equipment. Defense reorganizations, which left service autonomy largely intact, have not solved this part of the problem.

Successful joint operations show that interaction enhances interoperability by revealing problems, suggesting solutions, and promoting trust. But the lessons learned during previous joint operations were often lost because the services returned to their normal single-service operations after each conflict. Since the services remain responsible to train and equip their forces, sustained improvements to interoperability require changing service culture. Increased routine interaction will help to preserve the lessons learned during previous joint operations and to alter the experiences of the services that form the basis of service culture. As interaction becomes a normal part of each service's operations, interoperability will become an important requirement for each service. As service culture changes to accept the importance of interoperability, it will become a planning assumption for service staffs. Increasing routine

interaction will accomplish what centralized command structures could not:

interoperable armed forces.

I. INTRODUCTION

Although they have received more emphasis in recent years, joint operations have occurred throughout U.S. history. As joint operations become a larger part of U.S. military operations, the ability of the armed forces to conduct them effectively becomes more important. Past joint operations have had mixed success, and those that succeeded often repeated problems experienced in previous conflicts.

An increasingly risk-averse Congress, and the public they represent, will be less tolerant of such initial growing pains in future joint operations. Interoperability has become a required capability of the armed forces. For this thesis, "interoperability" is the capability of forces from one service to operate effectively with forces from other services. Interoperability requires compatible equipment and common doctrine, planned and exercised in advance, instead of relying on battlefield modifications of equipment and procedures.

Recognition of problems with joint operations is not new. Several defense reorganizations have occurred during this century, all of which focused on inadequate command structures as the main impediment to interoperability. In each case, unified command was seen as the means to make the services operate together effectively. None of the reorganizations were entirely successful in achieving this objective.

Defense reorganizations have not improved interoperability because their reliance on command structures only treats a symptom of the actual problem: the

objective. Interaction includes, but is not limited to, joint combat operations. It also includes activities where one service provides administrative, logistic, or other support to another service, or activities where two services have overlapping responsibilities.

Statutory divisions produced autonomous services, and separate missions caused a lack of interaction. These factors caused the services to evolve separately. The different experiences of each service, explained by different philosophies, created separate service cultures. Separate service cultures produced two main effects.

First, the separate philosophies of the services meant that they did not always agree on campaign goals. If the individual service commanders could not agree, cooperation would not occur. This was perceived as the actual problem, and was, therefore, the focus of efforts to improve interoperability during and after World War II.

Second, the service staffs designed equipment and procedures to accomplish their individual missions with little regard for operations with the other services. In many cases, this produced coincidentally incompatible procedures and equipment. Defense reorganizations, which left service autonomy largely intact, have not solved this part of the problem.

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the lessons learned during previous joint operations and to alter the experiences of the services that form the basis of service culture. As interaction becomes a normal part of each service's operations, interoperablity will become an important requirement for each service. As service culture changes to accept the importance of interoperability, it will become a planning assumption for service staffs. Increasing routine interaction will accomplish what centralized command structures could not: interoperable armed forces.

This thesis surveys past joint operations and uses basic psychological and sociological concepts to present an alternate explanation for interoperability problems and to propose a possible solution for those problems. It is limited by two factors. There has been little study of pre-World War II joint operations, as opposed to the separate study of military and naval operations, requiring this author to extrapolate relationships between the persons involved. Psychological and sociological studies of military affairs have focused on how individuals adapt to military life or how unit cohesion develops, rather than how personnel absorb the attitudes that comprise service culture. As a result, many of the ideas in this thesis are proposals rather than proof. Further research is needed to validate the individual facets of the conceptual framework presented here.

Chapter II examines problems with joint operations and how defense reorganizations failed to solve those problems. Chapter III discusses the historical sources of problems with interoperability, how separate service cultures produced non-interoperable forces, and why defense reorganizations alone failed to make lasting improvements to interoperability. Chapter IV examines successful joint operations to

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show how interaction promotes interoperability, discusses how routine interaction can sustain improvements to interoperability, and proposes means to increase routine interaction. Finally, Chapter V analyzes recent events to determine their impact on increasing routine interaction, and draws conclusions about the future of interaction and interoperability.

II. PROBLEMS AND ATTEMPTED SOLUTIONS

A. INTEROPERABILITY: AN ENDURING PROBLEM

According to <u>Joint Warfare of the Armed Forces</u>, Joint Publication 1 of 11 November 1991:

> [the] nature of modern warfare demands that we fight as a team . . . .Joint force commanders choose the capabilities they need from the air, land, sea, space and special operations forces at their disposal . . . . Joint warfare is essential to victory.[1]

Joint Publication 1 gives the impression that the requirement for interoperability has recently been recognized, and that the Armed Forces should incorporate this lesson into their planning.

This is not the case. Efforts to improve interoperability began with the establishment of the Joint Army and Navy Board in 1903. <u>Joint Action of the Army and the Navy</u>, signed by the Secretaries of War and Navy in 1927, states that:

> [it] is vital to success in war that the Army and the Navy so coordinate their actions as to produce the most effective mutual support. [This requires] that both services have a common, definite understanding of their respective functions in national defense and of the approved methods for attaining coordination in operations.[2]

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[1] Department of Defense, Joint Chiefs of Staff, <u>Joint Warfare of the Armed Forces</u>, Joint Publication 1 (Washington: National Defense University Press, 1991), iii.

[2] Joint Army and Navy Board, <u>Joint Action of the Army and the Navy</u> (Washington: Government Printing Office, 1927), iv. Hereafter cited as <u>JAAN</u>.

Although the need to conduct joint operations has long been recognized, the U.S. has a mixed record of success with interoperability. This chapter examines the problems experienced during several U.S. joint operations, since they motivated the defense reorganizations carried out during this century. The provisions of each defense reorganization will be reviewed. Analyses of subsequent joint operations are used to determine the effectiveness of each reorganization in improving interoperability.

B.   19th CENTURY JOINT OPERATIONS

1.   The War of 1812

The War of 1812 provided an early opportunity for joint operations, especially in the northern theater. Lakes Erie and Ontario divided the theater, and Lake Champlain stood along the traditional invasion route between New York and Montreal. A successful campaign would require control of these waters, and would be aided by effective cooperation between land and naval forces.

Unfortunately, such cooperation was not always present. Captain Isaac Chauncey, commanding U.S. naval forces on Lake Ontario, interpreted his orders from the Secretary of the Navy as a mandate to destroy the enemy fleet; he would "not be diverted in [his] efforts . . . by any sinister attempt to render [his forces] subordinate to, or an appendage of, the army."[3] Although he adequately supported Major General Dearborn's expedition against York in the spring of 1813, he refused to support a similar expedition by Brigadier General Harrison in late 1813. President Madison approved an attack in July 1814 against York. Since Chauncey's orders

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[3] Chauncey quoted in Lawrence Legare, Unification of the Armed Forces (Washington: Chief of Military History, Department of the Army, 1958), 18.

from the Secretary of the Navy did not specify direct support, he would not participate in the campaign.[4] When Brigadier General Izard's forces arrived in Niagara in October 1814 to buttress the American positions on the Canadian side, he could not expand his operations further into Canada in part because "Chauncey would not offer the needed naval support."[5]

2. The Civil War

Although naval forces could "establish a local blockade and seize relatively minor settlements pretty much at will,...the active cooperation of the...army was absolutely essential in taking well-garrisoned strongholds."[6] Control of the coast and of the Mississippi would require effective joint action. This did not always occur.

After taking New Orleans in February 1862, the Union naval force under Rear Admiral Farragut continued up river. In the meantime, the Western Flotilla was fighting down the river from Cairo, Illinois. In June 1862, the combined naval forces met at Vicksburg, the last remaining Confederate stronghold. Farragut, unable to take Vicksburg without land forces, requested assistance from Major General Halleck, commanding the Western Department. Halleck, preoccupied with the aftermath of Shiloh, ignored Farragut's request. The opportunity to take permanent control of the

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[4] Legare, 16-18.

[5] Hassler, 94.

[6] Kenneth Hagan, This People's Navy (New York: Free Press, 1991), 169.

Mississippi was lost, and the Confederates were able to fortify Vicksburg.[7] After Major General Grant relieved Halleck later that month, a coordinated attack was planned, and Vicksburg fell to a Union siege on 4 July 1863.

In mid-1863, Charleston was one of the few Confederate ports still open. Naval operations alone could not reduce the harbor defenses, so the Navy asked for Army support.[8] The Navy wanted to take the city itself, but the Army was content to take the outlying islands and isolate the city, especially since Chief of Staff Halleck "never thought Charleston -- or the fleet -- of any importance."[9] Operations against the barrier islands were successful, but the Army would not provide the forces needed to actually take the city, since this was not important to them. During the siege, both services independently planned assaults to take Fort Sumter on 7 September 1863. After learning of the Navy plan, Brigadier General Gillmore suggested a coordinated attack. Rear Admiral Dahlgren insisted that a naval officer command the operation. Gillmore decided that cooperation would not be possible and cancelled the Army attack. The naval attack proceeded, and failed with heavy losses.[10]

By the end of 1864, Wilmington, North Carolina, was the only remaining Confederate port. The Navy was anxious to close the port, but the Army felt compelled by political constraints to "cover" Washington against any moves the Confederates might make. As a result, the Army only sent 6,500 lightly armed,

[7] Allan Millet and Peter Maslowski, For The Common Defense (New York: Free Press, 1984), 179-180.

[8] Rowena Reed, Combined Operations in the Civil War (Annapolis: Naval Institute Press, 1985), 297.

[9] Reed, 314.

[10] Legare, 31-32.

inexperienced troops instead of the 10,000 veterans requested by the Navy.[11] In December 1864, a joint assault on Fort Fisher was launched. But the light armament of the Army forces required an unsupported naval bombardment, in spite of the lesson from Charleston that naval bombardment alone would not reduce land fortifications. The assault was aborted when the Army forces determined that the bombardment had failed to significantly affect the fort.[12]

3. Santiago de Cuba (1898)

The Cuban campaign of the Spanish-American War provided a striking example of poor interservice cooperation. As war broke out, the Spanish fleet sailed for Cuba. Rear Admiral Sampson, commander of the North Atlantic Squadron, was ordered to attack Admiral Cervera at Santiago, but the extremely narrow, mined entrance to the harbor and the Spanish forts overlooking its entrance prevented the U.S. forces from engaging Cervera.[13] Sampson requested Army assistance to capture the forts. This would allow the Navy to sweep the mines, enter the harbor and destroy Cervera's fleet.

Major General Shafter and a 17,000-man expeditionary force were ordered to Cuba. Shafter and Sampson conferred to plan the campaign. Sampson saw the taking of the forts as the only objective of the land operations. Shafter's orders listed two tasks: taking the garrison at Santiago and assisting the Navy. Shafter decided to attack the city and ignore the Navy, to the extent of not asking for assistance during

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[11] Reed, 331-32.

[12] Reed, 352.

[13] Hagan, 223-224.

bloody attacks at El Caney and San Juan Hill, which were well within the range of naval guns waiting offshore. During the siege of Santiago, Shafter urged Sampson to enter the bay and attack the city from behind. Sampson agreed to do so if the forts at the entrance were taken, but Shafter claimed that he needed all of his forces for the siege. As a result, the Navy did not participate in the taking of Santiago, and Shafter did not allow any naval officer to sign the surrender document.[14]

C.   THE JOINT BOARD AND THE SEARCH FOR UNITY OF COMMAND

Problems with these operations can be attributed to the failure of the services, and especially their local commanders, to agree on campaign goals and means of execution. This problem was aggravated by the lack of any mechanism to regulate interactions between the services short of the President, who was usually unwilling to intervene. The need for sub-cabinet level direction of operations involving both Army and Navy forces had been identified before the Spanish-American War; it was a motivating factor for the formation of the Joint Army-Navy Board in 1903.[15]

The Joint Board consisted of four officers each from the Army General Staff and the Navy General Board. Before World War I, its record was undistinguished. Instead of resolving problems with joint operations, it largely confined itself to ceremonial and other administrative issues. In 1907, the Board's inability to reach consensus on a

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[14] Millet & Maslowski, 278-281.

[15] Hagan, 207.

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contingency plan for a possible war with Japan enraged President Theodore Roosevelt.[16] The Board also fell into disfavor with President Wilson,[17] and it lay moribund throughout World War I.[18]

The Board was reconstituted in July 1919. Its members were designated by billet: the Army Chief of Staff and his operations and war plans deputies, and the Chief of Naval Operations, the Assistant CNO and the head of the naval war planning division. A Joint Planning Committee was established, consisting of three officers from each war plans division.[19] This composition gave the Board the authority to devise plans acceptable to both services and to mandate their execution. But this was not the case. Decisions of the board required consensus, which was often impossible. The presidents and the service secretaries of this period showed little interest in war planning, so there was no voice to resolve disputes.

One of the most contentious issues that confronted the Joint Board throughout its existence was command of joint operations. These discussions focused on the concepts of "mutual cooperation" and "paramount interest." Mutual cooperation assumed complete independence of command, with each commander directing his forces to complete his own service's mission, supporting the efforts of the other service if possible. This had been the *de facto* mode of interaction between Army and Navy commanders throughout U.S. history. Paramount interest also assumed

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[16] Hagan, 238-239.

[17] Miller, 22.

[18] Miller, 14.

[19] American Way, 245, and Miller, 83-84.

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independence of command, though the missions of one service could be subordinated to support the other if the situation warranted. Although the idea of unified command received some discussion, and even occasional support, it was largely rejected by the Joint Board.[20] This view ignored the fact that Admiral Sampson and General Shafter could neither determine paramount interest nor exercise mutual cooperation.

By 1938, the Joint Board eliminated paramount interest and mandated mutual cooperation. Unified command would only occur:

(1) When ordered by the President; or

(2) When provided for in joint agreements between the Secretary of War and the Secretary of the Navy; or

(3) When commanders of Army and Navy forces agree that the situation requires the exercise of unity of command and further agree as to the service that shall exercise such command.[21]

This structure remained unchanged through the rest of World War II, though it did not prevent the establishment of joint and combined commands in all theaters.[22] But neither did it provide a framework that would ensure effective interoperability.

D. WORLD WAR II

The experiences of World War II show that mutual cooperation did not ensure effective interoperability. But they also show that unified command in the theaters did not, by itself, solve the problems that had plagued previous joint operations.

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[20] C. Kenneth Allard, Command, Control and the Common Defense (New Haven: Yale University Press, 1990), 94-96.

[21] Joint Action of the Army and Navy (1938), quoted in Legare, 162.

[22] Legare, 163.

1. Pearl Harbor

Hawaii in 1941 should have been an superior example of effective mutual cooperation. Admiral Kimmel, Commander-in-Chief, US Fleet, and Lieutenant General Short, commander of the Hawaiian department, were close friends.[23] But their personal relationship did not ensure an effective joint defense plan. Tasks were apportioned among the services, and each assumed that the other would fulfill its responsibilities.

This did not occur. Each service took actions affecting the defense of Hawaii without informing the other. The Navy was to provide long-range aerial reconnaissance. When the war warning message of 27 November 1941 was sent by the CNO, Kimmel concluded that available naval forces could not provide 360° of effective surveillance, so he decided not to provide any reconnaissance at all. Kimmel did not inform Short that there were any problems with conducting the reconnaissance, much less that it would not even be attempted.[24] But neither did Short, directed to "undertake . . . reconnaissance"[25] by the Army's war warning message, attempt to verify what measures were being taken.[26]

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[23] Gordon W. Prange, et al, Pearl Harbor: The Verdict of History (New York: McGraw-Hill, 1986), 376.

[24] Prange, 439-41.

[25] Prange, 651.

[26] Prange, 365.

The Army was to install and operate a radar net and conduct inshore air patrols.[27] On 7 December, the radar net was only operating from 0400 to 0800, and there was no effective means for the Signal Corps' radar operators to alert and direct the Air Corps' pursuit pilots.[28] But the Navy was not informed about any problems, and Kimmel "presumed that the steps necessary to make the . . . radar . . . effective had been taken."[29] Kimmel's subordinates had few expectations, if any, from the radar net; many of them did not know of its existence.[30]

The services' alert structures were inconsistent. Both had three levels, but applied them differently. For the Navy, Condition 1 was the highest alert. Naval procedure was to go to Condition 1 first, relaxing to lower levels if the situation warranted. For the Army, Alert Number 1 was the lowest alert, and Army policy was to institute the lowest level alert deemed necessary for a given situation.[31] In fact, Kimmel, upon hearing that the Army had gone to Alert Number 1, assumed that they had gone on full alert;[32] his chief of staff believed that the Army had only one type of alert.[33]

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[27] Roberta Wohlstetter, Pearl Harbor: Warning and Decision (Stanford: Stanford University Press, 1962), 5.

[28] Wohlstetter, 8-10.

[29] Congress, Hearings before the Joint Committee on the Investigation of the Pearl Harbor Attack, 79th Congress, 1946, 6:2586, quoted in Prange, 447-48.

[30] Wohlstetter, 28.

[31] Wohlstetter, 403-4.

[32] Wohlstetter, 47.

[33] Prange, 447.

Among the intelligence organizations, only the Army's Hawaiian Department G-2 and 14th Naval District Counterespionage Officers had regular contact.[34] Operational liaison between the 14th Naval District and the Hawaiian Department consisted of one Lieutenant Harold Burr, "a bright fellow, very loyal, very willing, but not a very experienced officer."[35] The congressional investigation concluded that:

> there was a complete failure in Hawaii of effective Army-Navy liaison during the critical period November 27 to December 7. There was but little cooperation and no integration of Army and Navy facilities and efforts for defense. Neither of the responsible commanders knew what the other was doing with respect to essential military activities.[36]

Each service's plan assumed that the other was doing its part and that mutual cooperation could be relied upon to defend Hawaii, but there was no routine interaction between Army and Navy forces. As a result, there was no way to test the plans. "Mutual cooperation," without routine interaction, could not produce an effective joint operation.

Unity of command was eventually instituted, but only on an *ad hoc* basis through 1942. A JCS paper entitled "Unified Command for Joint Operations" was approved in April 1943 after nine months of study and delay. Even this paper did not require unified command, and only provided "broad principles governing the selection of a joint commander, his relation to his subordinate commanders, the scope of hi:

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[34] Wohlstetter, 36.

[35] Prange, 391.

[36] Congress, Joint Committee on the Investigation of the Pearl Harbor Attack, <u>Investigation of the F</u> <u>Harbor Attack</u>, 79th Cong., 2nd Sess., 20 July 1946, Report, 156.

responsibility, and the provision of a staff to assist him."[37] The need for U.S. forces

to develop concepts of joint command was intensified by the need to operate with

British forces, who already operated under such principles.[38]

2.   Amphibious Warfare and Close Air Support in the Pacific Theater

Unity of command did not ensure unity of purpose among the services.

Neither did it ensure interoperability; only months of costly errors pointed the way

toward solutions. The war in the Pacific, and close air support of ground troops in

particular, illustrate that unity of command did not, by itself, promote unity of purpose

or interoperability of forces.

The Solomons campaign is often cited as an example of interoperability

during World War II. Forces from all services supported each other, and all land

based air assets were under unified command. But even here, there were problems.

Unified command was instituted because little support was forthcoming from the

United States; survival mandated coordinating the few available assets.[39] The carrier-

based air forces were not under this command; they were only committed to the

operation until two days after the invasion of Guadalcanal because their commander,

Vice Admiral Fletcher, felt it was unsafe to remain. After this, the land-based forces

were left on their own.[40]

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[37] Legare, 221-23.

[38] Millet & Maslowski, 406.

[39] James Winnifield and Dana Johnson, Joint Air Operations: Pursuit of Unity in Command and Control, 1942 - 1991 (Annapolis: Naval Institute Press, 1993), 34.

[40] Jeter Isley and Philip Crowl, The U.S. Marines and Amphibious War: Its Theory, and Its Practice in the Pacific (Princeton: Princeton U. Press, 1951)

Close air support of ground troops was also a problem. The Marines developed close air support doctrine in the 1920s and 1930s and employed it in expeditionary duty in Nicaragua.[41] But Marine pilots were stationed elsewhere, and the burden of close air support often fell on Navy and Army pilots who had little or no training in such tactics. They learned, but their effectiveness was reduced while they did.[42]

E.   NATIONAL SECURITY ACT OF 1947

World War II showed that command of joint operations by mutual cooperation left much to be desired. Although the command structures and operating techniques developed during the war were effective in defeating the enemy, changes were clearly required to codify the *ad hoc* procedures that made victory possible.

The first reorganization was the National Security Act of 1947. Its proponents advocated unifying the armed forces into a new Department of National Defense, and demoting the service secretaries to Assistant Secretaries. Congressional opponents, fearing a "'Prussian' military centralization," prevented unification. Instead, the act established a Secretary of Defense to coordinate the activities of the Departments of

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[41] Isley & Crowl, 33.

[42] Isley & Crowl, 508-09.

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War, Navy, and a newly created Department of the Air Force, all of which would retain cabinet rank. It also codified the Joint Chiefs of Staff.[43] The Joint Army-Navy Board, moribund since the establishment of the JCS, was formally abolished in 1947.[44]

Under this system, the Secretary of Defense was to oversee the operation of the military establishment, but had little authority to enforce his will.[45] The Hoover Commission, appointed to find ways to improve the national security process, supported increased centralization. Congress agreed and amended the Act in 1949. The amendment created a Department of Defense, and subordinated the three service secretariats to the Defense Secretary. A non-voting Chairman of the Joint Chiefs of Staff was also established.[46] Again, command structure was seen as the tool to restrain service parochialism and, it was thought, to enhance the national defense.

F. KOREA

The Korean conflict showed that stronger joint command structures did not improve interoperability. It soon became apparent that the lessons learned during World War II had largely been forgotten. There was no joint plan to defend Korea.[47]

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[43] Russell Weigley, The American Way of War: A History of United States Military Strategy and Policy (Bloomington: Indiana University Press, 1973), 374. Hereafter cited as American Way.

[44] Legare, 221.

[45] American Way, 376.

[46] Russell Weigley, History of the United States Army (New York: Macmillan, 1967), 494-95. Hereafter cited as Army.

[47] Winnifield & Johnson, 53.

Control and utilization of air forces (including naval aviation) were problems throughout the war. A Joint Operations Center was established in July 1950 by the Fifth Air Force to control air operations. But Army organizational problems prevented its participation until the spring of 1951. The Marines quickly established a liaison officer in the JOC and allowed JOC to task the 1st Marine Air Wing -- except when it was directly supporting the 1st Marine Division.[48] The Navy insisted on retaining control of carrier based air; its liaison officer "had no authority to commit Task Force 77 to a desired action." One week before the cessation of hostilities,[49] the commanders of the Fifth Air Force and the Seventh Fleet finally agreed to fully integrate carrier aircraft into the joint organization.[50] Even within this framework, operational planning consisted mainly of dividing the peninsula into sectors of responsibility for each service or component (Far East Air Forces Bomber Command and Fifth Air Force were allocated separate regions). Unfortunately, as Winnifield and Johnson point out:

> the urgency of striking the target, service-specific hardware limitations, or sortie availability meant that one service could not do the job itself. All that such partitioning did was to compensate for the absence of joint service procedures and plans for the effective utilization of the airpower within the theater.[51]

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[48] Winnifield & Johnson, 45.

[49] Winnifield & Johnson, 61.

[50] Winnifield & Johnson, 49-50.

[51] Winnifield & Johnson, 53.

Air Force close air support, especially at the beginning of the war, was "handicapped because [it] had neglected tactical air support while concentrating on readiness to deliver the atomic bomb, and the Fifth Air Force and Eighth Army in Japan in particular had not carried out exercises in air-ground coordination."[52] Navy-Marine definitions of such terms as "close support" and "deep support" did not agree with those of the Air Force, which further complicated coordination.[53] Air Force communications systems stressed high capacity between central command and operating bases, but "limited provision for tactical communication at the scene of action." Navy and Marine communications had the opposite emphasis. As a result, interservice coordination of assets was inadequate during both mission allocation and execution.[54] Overall, Winnifield and Johnson evaluate the experiences of Korea as a "failure of peacetime and wartime command alike to deal adequately with the requirements for truly effective joint operations."[55]

G.   DEFENSE REORGANIZATION ACT OF 1958

President Eisenhower enacted Reorganization Proposal 6 in June 1953 to fulfill a campaign promise to improve the organization of DoD. This plan strengthened the Chairman's authority by allowing him to approve appointments to the Joint Staff and

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[52] American Way, 385.

[53] American Way, 43-44.

[54] Winnifield & Johnson, 58-59.

[55] Winnifield & Johnson, 60.

gave the service chiefs' JCS duties statutory precedence over their service duties.[56]

But this was not sufficient, and Eisenhower proposed another amendment to the National Security Act. He introduced the proposal in an address to Congress in which he stated that:

> [s]eparate ground, sea, and air warfare is gone forever. If ever again we should be involved in war, we will fight it in all elements, with all services, as one single concentrated effort . . . singly led and prepared to fight as one, regardless of service.[57]

As passed, the Defense Reorganization Act of 1958 removed the operational authority of the service chiefs, who had previously commanded the unified commanders from their services (i.e., Atlantic and Pacific Commands under the CNO and European Command under the Army Chief of Staff). It also expanded the Joint Staff and permitted the Chairman to vote on issues affecting the JCS.[58]

H.   CONTINUING PROBLEMS WITH INTEROPERABILITY

1.   Vietnam

Many of the lessons learned in Korea had been forgotten by the time of the Vietnam conflict. The Air Force had once again abandoned close air support in favor of more "strategic" roles for theater air forces. It only had 23 O-1 spotter

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[56] Army, 548.

[57] Congress, Senate, Congressional Record, 99th Congress (3 October 1958), S12535.

[58] Army, 548-49.

aircraft,[59] and their radios were incompatible with Army helicopter and ground force radios. Instead, they carried an infantryman's portable radio as an interim measure for nearly two years until a permanent radio with adequate range could be installed.[60] After the Tonkin Gulf crisis, a lack of common procedures among the Army and Air Force delayed improvements to communications facilities between bases in Thailand.[61]

As in Korea, the Marines retained command of their air forces. Until 1967, this was not a problem, as the Marines controlled I Corps and the Army operated in the other three corps areas. But as the Army moved north, the Air Force followed, and coordination problems increased. During the defense of Khe Sanh in 1968, separate Air Force and Marine control systems caused both services to attack some targets, sometimes simultaneously, while others were ignored. After the 1st Marine Air Wing failed to provide adequate support to Army divisions in the northern I Corps area, General Westmoreland argued to the Joint Chiefs that a single unified commander for tactical aviation should be established. The Marine Corps Commandant objected on doctrinal grounds. The Army Chief of Staff would not support Westmoreland because he feared setting a precedent that would allow the Air Force to take control of Army helicopters. As a compromise, Commander in Chief, Pacific, gave 7th Air Force "mission direction" over Marine air assets in I Corps. 7th AF interpreted this as operational control, while the Marines assumed two exceptions:

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[59] Winnifield & Johnson, 81.

[60] John Bergen, United States Army in Vietnam: Military Communications -- A Test for Technology (Washington: U.S. Army Center of Military History, 1986), 57.

[61] Bergen, 106.

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that they could obtain immediate strikes in air-ground team operations, and that they could appeal 7th AF decisions over COMUSMACV directly to CINCPAC. In effect, this negated any operational control of Marine aircraft.[62]

The relationship between the Navy and Air Force in Vietnam was much the same as in Korea. Route packages were established that delineated zones for each service to operate in. Although successive 7th Air Force commanders called for unity of command of air assets, there is little evidence of strained Air Force - Navy relations. This is because the route package system delivered satisfactory results without the need to address fundamental differences.[63]

2. Iran Rescue Attempt

In April 1980, a joint force attempted to rescue the Americans being held hostage in the U.S. embassy in Teheran, Iran. After a series of mechanical failures, the operation was aborted. During the withdrawal, a helicopter and a C-130 tanker collided. Both aircraft were destroyed, and the other helicopters were abandoned intact, with weapons and classified documents still aboard.[64] The investigation of the incident revealed that established joint task force procedures were ignored in favor of an *ad hoc* command and staff system.[65] Since the special operations forces of the various services had not operated together in many years, they had developed different operating procedures and philosophies. Joint task force procedures existed,

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[62] Winnifield & Johnson, 70-74.

[63] Winnifield & Johnson, 77-78.

[64] Paul B. Ryan, The Iran Rescue Mission: Why It Failed (Annapolis: Naval Institute Press, 1985), 91.

[65] Ryan, 21.

but had not been practiced. Consequently, the service component commanders had different interpretations of the mission plan and the procedures to be carried out in case of problems. A rehearsal would have pointed out these differences, but concern for secrecy precluded one.[66]

3. Grenada

In October 1983, Operation Urgent Fury was mounted against the Caribbean island nation of Grenada. The operation was ultimately successful, but several problems indicate that a lack of interoperability hampered the mission. The maps that the Marines carried had a different grid system than those carried by the Army,[67] resulting in several instances of fire support being directed onto friendly positions.[68] Army units were unable to talk directly to naval air assets, since their radio frequencies were different. In the initial phase of the operation, Army fire support requests had to go to Fort Bragg, North Carolina, then via satellite to the naval commander.[69] According to Marine Corps Commandant Mundy, "while the mission was accomplished, it is generally agreed that we failed miserably in achieving unity of effort and were not as effective as we should have been."[70]

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[66] Ryan, 81.

[67] John Fialka, "In Battle for Grenada Commando Missions Didn't Go As Planned," The Wall Street Journal, 15 November 1983, 1.

[68] Ibid., 1.

[69] Army Times, 5 November 1984, 34.

[70] Carl E. Mundy, Jr., Gen. USMC, "Complementary Capabilities from the Sea," Joint Force Quarterly 1 (Summer 1993): 18.

4. Conclusions

The provisions of the 1958 Defense Reorganization Act did not prepare the armed forces to conduct integrated joint operations. In extended operations, as in Korea and Vietnam, differences in equipment were eventually overcome and differences in doctrine were accommodated or made irrelevant by the division of responsibilities. In Grenada, similar problems were inconvenient, but the overwhelming superiority of U.S. forces ensured success in spite of problems with interoperability. In the Iran hostage rescue attempt, however, problems with interoperability had more tragic results. In all cases, the services did not incorporate the lessons from these operations in their later planning, and later repeated similar mistakes. The command structures imposed by the 1958 Act did not create effectively interoperable forces, as President Eisenhower had hoped.

I. GOLDWATER-NICHOLS ACT OF 1986

By 1985, Congress was convinced that interservice rivalry and parochialism were preventing the armed forces from operating as a team, and that encouraging "jointness" was the key to reversing this trend.[71] The result of the congressional debate was the Goldwater-Nichols Act of 1986. The Act made several changes designed to enhance the capabilities of joint entities. The Chairman of the Joint Chiefs of Staff was designated as the principal military advisor to the National Command Authority. A Vice Chairman was created to relieve the Chairman of some

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[71] Craig Faller, "The Navy and Jointness: No Longer Reluctant Partners?" (Master's thesis, Naval Postgraduate School, 1991). Chapter 4, Section A, provides a detailed history of the events that motivated GNA and its evolution.

routine administrative tasks.[72] The unified commanders were specifically given operational control of the forces within their areas of responsibility, and were given limited input into their budgets.[73] Finally, requirements for joint officer assignment and education were established in order to ensure that quality officers would be assigned to joint and unified staff duty and that they would be well prepared for their tasks.[74]

J.   DESERT STORM

Operation Desert Storm was the first test of the structures put into place by Goldwater-Nichols. In many ways, the provisions of the Act were vindicated. The unified Central Command executed a complex operation. But there were indications that interoperability was still a problem. The most glaring example was the air tasking order (ATO), which had to be physically taken to each aircraft carrier because the Navy did not have the communications hardware needed for its electronic transmission.[75] The Navy recognized this problem as early as October 1988, but did not procure the necessary communications equipment, despite the effective integration of Navy aircraft into the JFACC concept using borrowed Air Force equipment during the 1989 Solid Shield exercise.[76] Navy fighter aircraft also lacked target identification (IFF) equipment needed to satisfy the requirement in the rules of engagement for dual

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[72] Department of Defense, Armed Forces Staff College, The Joint Staff Officer's Guide 1991, AFSC Publication 1 (Washington: Government Printing Office, 1991), 2-11. Hereafter cited as JSO Guide.

[73] JSO Guide, 2-19 to 2-23.

[74] Faller, 73-75.

[75] Winnifield & Johnson, 109-10.

[76] Faller, 104-105.

phenomenology identification of air contacts prior to engagement. The result was that Navy fighters could not be used in certain CAP stations.[77] Four years after the passage of this so-called revolution in joint affairs, serious barriers to interoperabilty remained. The failure of GNA to reduce service autonomy meant that the problems that produced non-interoperable forces would continue.

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[77] Winnifield & Johnson, 115.

III. THE REAL PROBLEM: LACK OF ROUTINE INTERACTION

Defense reorganizations were intended to improve interoperability by creating centralized command structures that would enforce unity of effort. The record of joint operations in the last fifty years shows that interoperability problems have continued despite increasing command centralization.

Defense reorganizations have not improved interoperability because they only treated a symptom of the actual problem: the lack of routine interaction between the services. This chapter reviews the statutory and historical factors that minimized interaction and how this created autonomous services with separate cultures. It describes how lack of interaction caused the services to disagree on campaign goals and to devise coincidentally incomparable procedures and equipment. Finally, it shows how centralizing command structures has not increased routine interaction between the services and how this presents continued impediments to interoperability.

A. HISTORICAL ROOTS OF THE PROBLEM

Statutory divisions and separate roles and missions have largely prevented routine interaction between the services throughout U.S. history. In spite of unified command and centralized administration created by defense reorganizations, the services retain much of the autonomy that has characterized their relationship since the establishment of the Navy Department in 1798. This marked the beginning of the statutory autonomy of the services. From this point until the end of World War II,

Army and Navy administration were entirely separate from one another, and their dealings with Congress were handled by separate Military and Naval Affairs Committees.[78]

Defense reorganizations have been offered as a means to enhance interoperability by reducing service autonomy. Unfortunately, none of the reorganizations to date have done so. Although the services secretaries have been demoted from cabinet rank, the services still organize, train, and equip their own forces.[79] Although budget approval authority has been given to the Secretary of Defense, "the generals and admirals . . . not only [draw] up the basic document but [defend and justify] it throughout each phase of the congressional appropriations process."[80] Even the unified commanders, finally given explicit operational command of their forces, command these forces through dual-hatted component commanders who also answer to (and are funded by) their individual services. The effect of the defense reorganizations has been to install joint structures at the national command level while only marginally reducing the statutory separation of the services.

The missions of the individual services throughout U.S. history have also served to minimize interaction between the services. This lack of interaction was further encouraged by congressional parsimony, which mandated small force structures.

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[78] Allard, 72, 96.

[79] Allard, 246.

[80] Allard, 129.

Separate missions made interaction seem unnecessary; the far-flung commitments of the minuscule forces meant that none were available to develop and practice joint capabilities that seemed far removed from their normal missions.

The predominant mission of the Army has been constabulary duty. In the thirty years following the War of 1812, the Army fought two campaigns and several smaller actions against the Indians, as well as policing the rapidly expanding frontier.[81] Although nominally organized into regiments, it typically was stationed in companies or platoons. In 1850, its 10,763 men were scattered among over one hundred posts.[82] After the Civil War, the Army returned to its pre-war mission, its size reduced from 1,000,516 in May 1865 to 25,000 by June 1874.[83] Coast defense, one area where interaction with the Navy would be expected, was largely ignored. Construction of fortifications lagged far behind Army aspirations, and only 151 of the 2,362 artillery pieces recommended in an 1885 study were in place by 1898.[84]

The Spanish-American War left the United States with a worldwide empire. The Army was tasked with additional constabulary responsibilities, especially in the Philippines. Congress was finally convinced in 1916 that these new responsibilities required increased force levels, but the increases were tied as much to the threat of U.S. involvement in World War I as to peacetime needs.[85] After a wartime peak of

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[81] Allard, 41.

[82] Hassler, 143.

[83] Hassler, 189.

[84] Hassler, 192.

[85] Millet & Maslowski, 331.

over 3 million, budgets kept Army force levels at about 130,000 through the mid-1930s.[86] This was about one-quarter of Army requests, and about half of the force that Congress authorized.[87]

Even post-World War II Army missions have been mainly single service. Beginning once again with constabulary duty in Japan and Germany, their role became one of forward defense against a Soviet bloc attack in these countries and Korea. This mission only depended on the Navy for defense of resupply shipping, which required little direct contact. The Army also needed Air Force support for air resupply, which required a relationship only slightly closer than that with the Navy, and close air support, which the previous chapter showed was a low priority item for the Air Force.

The predominant mission of the Navy has been the protection of U.S. shipping and freedom of navigation. As with the Army, the Navy has carried out its mission using small groups of widely scattered forces throughout most of its history. Until the 1880s, the Navy typically operated in squadrons of two or three vessels under the command of the senior captain, with six permanent squadrons assigned by 1830.[88] After the Civil War, the Navy returned to its role of protecting overseas commerce.

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[86] Millet & Maslowski, 378.

[87] Millet & Maslowski, 366.

[88] Allard, 39.

Its wartime fleet of 671 ships was reduced to 103.[89] Lack of manning hampered the ability to deploy these ships; by 1877, there were only 7,012 enlisted men in the entire Navy.[90]

The Navy started a building campaign after 1880, but Congress only relented after the Navy's inferiority to smaller powers became clear, and it was less than the Navy thought necessary. The reason for the buildup, however, was to counter the fleets of other world powers on the high seas, not to support land forces. This emphasis on engagements on the high seas continued through the late 1980s, with the threat of the traditional Great Powers replaced by that of the Soviet Navy. This role required little or no interaction with the other services.

The development of military aircraft formed a large part of the debate concerning the relationship between land and naval forces after World War I. But naval aviation was firmly wedded to the Navy, and what would become the Army Air Corps chose to focus on heavy bombers that would supposedly make other forms of warfare obsolete.[91] As a result, the interaction between the services that the development of aircraft might have encouraged did not occur. After its establishment as a separate service, the Air Force continued this detachment from the other services. Its devotion to intercontinental bombers and missiles, and to the fighters and interceptors that would defend them, minimized interaction with the other services. The hesitation of

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[89] Hagan, 176.

[90] Hassler, 211.

[91] Alexander DeSeversky, Victory through Air Power (New York: Simon and Schuster, 1942), 26, in Carl Builder, The Masks of War: American Military Styles in Strategy and Analysis (Baltimore: Johns Hopkins University Press, 1989), 69.

the Air Force to embrace the close air support mission has already been documented; its relationship with the Navy has been no closer. Although transport and close air support require some relationship with the Army and, to a much lesser extent, the Navy and Marine Corps, its preferred missions have required little interaction with the other services.

B.   THE RESULT: SEPARATE SERVICE CULTURES

In Organizational Culture and Leadership, Edgar Schein defines organizational culture as the

> pattern of basic assumptions - invented, discovered, or developed by a given group as it learns to cope with its problems of external adaption and internal integration - that has worked well enough to be considered valid, and therefore, to be taught as the correct way to perceive, think, and feel in relation to those problems.[92]

Each of the armed services has developed what this thesis will call "service culture" to evaluate its history and to act as the basis for decisions concerning the training and equipping of its forces.

The Navy's service culture has its roots in the concept of independent command at sea, reinforced by the single-ship and small squadron deployments characteristic of the Navy's first century. The Navy found its philosophical underpinning in the writings of Alfred Thayer Mahan. His advocacy of "control of the sea by decisive defeat of the enemy fleet"[93] motivated the naval buildup that began in the late 19th

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[92] Edgar H. Schein, Organizational Culture and Leadership (San Francisco: Jossey-Bass, 1985), 9.

[93] Allard, 11.

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century. Although Mahan stated that control of the sea would permit power projection ashore[94], his vision of sea control did not require the participation of land forces. Mahan's writings were validated by the fleet actions in the Pacific during World War II, and can be seen as the foundation for the Maritime Strategy of the late 1980s.

The Army's service culture is largely based on the writings of Clausewitz and Jomini, and focuses on the "destruction of the enemy army and effective control over the means required to bring this objective about."[95] Its experiences in World War II emphasized the need for effective combined arms operations, as opposed to the Navy's concept of independent command,[96] and formed the basis for its Air-Land Battle concept.

The Air Force culture is based on the writings of Giulio Douhet and Billy Mitchell. It asserts that air power is the decisive form of warfare that places other forms of warfare at an inherent disadvantage. Consequently, the Air Force has focused its attention on heavy bombers, the fighters and interceptors that allow the bombers to perform their mission, and nuclear weapons aboard intercontinental ballistic missiles.[97]

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[94] Allard, 11.

[95] Allard, 11.

[96] Builder, 142.

[97] Allard, 11.

C. THE PRODUCT: NON-INTEROPERABLE FORCES

Allard points out that the philosophies that are the basis of each service's culture "contradict the others in a number of important respects, and . . . no general theory has yet been discovered that is capable of reconciling them."[98] The results of this problem are predictable and well documented. First, the services have developed different views of how campaigns should be conducted. This problem has existed throughout U.S. history. In the War of 1812, Commodore Chauncey could not agree with the land commanders that naval support was needed to win the campaign. In the Civil War, Major General Halleck would not provide the land forces that could have taken Vicksburg in 1862. In the Spanish-American War, Rear Admiral Sampson and Major General Shafter could not agree on whether the land or the naval battle had priority. Since World War II, such disputes between the services have been considered a part of "interservice rivalry," especially where they involve competition for funds. The conflicts between the Air Force and the Navy concerning bombers vs. supercarriers and control of nuclear weapons are perhaps the most vivid examples of post-WWII disputes over the correct means to conduct campaigns. Disputes between service definitions of close air support in Korea and the continuing dispute between the Air Force and the Marine Corps over control of Marine air assets also illustrate the continuing nature of the problem.

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[98] Allard, 11.

A second result of contradictory service cultures is incompatible equipment and procedures that act as barriers to interoperability. Each service designs equipment for the tactical and operational environments envisioned by its respective service staff. The single-service operational experience upon which service cultures are based has produced equipment that is incompatible with that of other services, since these systems were not designed for use in joint operations.[99] The services are similarly responsible for training their own forces, and service culture determines what training its forces will receive. Different service cultures have produced incompatible doctrine and procedures just as it has produced incompatible communications equipment or ammunition.

The history of the U.S. armed forces provides many examples of equipment and procedural barriers to interoperability. Early U.S. history has fewer of these problems because lower technology armaments and smaller spans of control allowed them to be resolved in the field. For example, at the Battle of Mobile Bay in 1864, incompatible Army and Navy signal flag systems were resolved by stationing an Army signals officer on the bridge of Admiral Farragut's flagship.[100] As technology improved, however, equipment became more complex and tactical and operational procedures became more closely tied to this newer equipment. Differences became more apparent and solutions, especially *ad hoc* solutions, became more difficult to devise.

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[99] Allard, 130.

[100] Allard, 61.

D. FLAWED DIAGNOSIS: COMMAND STRUCTURES

Most proposed solutions to interoperability problems have focused on command structures. It was thought that unified command of operations and policy would encourage the services to abandon their single-service perspectives and embrace jointness in their planning. This did not occur because none of these reorganizations altered the actual reason for interoperability problems: the lack of interaction between the services.

Previous defense reorganizations have not substantially reduced the autonomy of the services. Despite the unified command structures that have been superimposed on the services, the day-to-day operations of the services require little interaction between them. This has served to reinforce the single-service perspective of each of their service cultures. Since their planning is based on these cultural norms, equipment design and personnel training has continued to emphasize single-service capability at the expense of interoperability. Since the national leadership has been unable or unwilling to reduce service autonomy, another path must be found if interoperability is to be improved.

IV. HOW ROUTINE INTERACTION IMPROVES INTEROPERABILITY

Increasing routine interaction between the services is the key to improved interoperability. Units and individuals from each service that encounter those from other services in their day-to-day operations will see joint operations as the rule rather than the exception. Different philosophical concepts will be required to explain this experience. In other words, service culture will change. Since interaction will be considered to be normal, interoperability will be an important consideration in equipment design and doctrinal development. Interoperability will be improved by the same process that was its biggest stumbling block.

This chapter analyzes some successful joint operations, emphasizing how interaction enhanced interoperability. The benefits of increased routine interaction are discussed in greater detail. Finally, some means to increase routine interaction will be proposed and compared to provisions of GNA.

A. SUCCESSFUL JOINT OPERATIONS

There have, of course, been successful joint operations. Understanding how and why they succeeded provides lessons for how to increase interaction and improve interoperability.

1. The War of 1812

Success on the Great Lakes required effective joint action. Commodore Chauncey's refusal to support land operations around Lake Ontario presents a stark contrast for a much more successful campaign against longer odds on Lake Erie. Brigadier General Harrison was ordered to retake Detroit and attack southern Ontario. Master Commandant Oliver Hazard Perry's mission was to take control of Lake Erie. But the British were using the lake to supply their land forces, which prevented Harrison from completing his mission, and Perry had insufficient manpower to build or man his planned squadron. Harrison provided troops to Perry, who built his squadron and defeated the British. Harrison was then able to recapture Detroit, after which Perry supported Harrison in an immediate attack into Canada. The loss of their naval force compelled the British to retreat,[101] and Detroit was secured for the remainder of the war.

2. The Civil War

In January 1862, Brigadier General Grant, Major General Halleck's deputy in the western theater, was advancing up the Tennessee and Cumberland Rivers. He planned to take Forts Henry and Donelson with support from Flag Officer Andrew Foote. Halleck, though concerned about detaching Grant's force from his center and skeptical about the effectiveness of naval gunfire, grudgingly approved.[102] By mid-February, both forts had fallen, forcing the Confederates to abandon Nashville.

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[101] Millet & Maslowski, 107.

[102] Reed, 85.

The failed assault on Fort Fisher, North Carolina, in December 1864 was discussed in Chapter II. Only one month later, however, the situation had dramatically changed. Major General Sherman had completed his "march to the sea," and wanted to continue through the Carolinas. Grant was determined that Sherman should not run out of stores, and decided that Wilmington was the logical place from which to support Sherman. The Navy was only too willing to cooperate.[103] A well-outfitted force was sent for the attack. Coordination with the Navy was effective. The limits of naval gunfire on shore targets, learned in Charleston in 1862 but forgotten during the first attack on Fort Fisher, were recognized and compensated for. A successful attack was mounted in January, 1865. Wilmington was taken, closing the port to raiders and blockade runners and ensuring support for Sherman.[104]

3. World War II

World War II began with a tragic example of the inability of the services to conduct joint operations: Pearl Harbor. Other problems soon became apparent, such as the unfamiliarity of the other services with amphibious doctrine, the Air Corps' inattention to close air support of ground forces, and differences over the proper use of air power between the Navy and the Air Corps as well as between the Air Corps and the rest of the Army. As the war progressed, the interaction that war forced on the services ensured that problems were specifically identified, and the need to overcome these problems ensured that solutions were found.

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[103] Reed, 356-57.

[104] Reed, 358-59.

The Cactus Air Force is an excellent example of how interaction can produce improvements in interoperability. The beginning of the Solomons campaign found Marine Lieutenant General Vandegrift on Guadalcanal with only a small number of Navy and Marine aircraft, augmented by Army Air Corps fighters and light bombers. These forces were of inadequate strength to operate independently, especially since their small numbers did not allow the tactics of any of the services to be employed effectively. Vandegrift saw that the only chance to employ these forces effectively was to place them under unified command. This marked the birth of the Air Solomons Command, called the Cactus Air Force after the code name for Guadalcanal. The Cactus Air Force devised tactics that best utilized their available forces, but required modification of the normal tactics for most of the aircraft types. Even as more aircraft finally arrived later in 1942, the Air Solomons Command remained a unified command, and would eventually be commanded by Army, Navy and Marine officers.[105]

The Southwest Pacific campaign provides another example of how interaction allows forces from different services to learn how to operate together. Initially, the Army forces were unfamiliar with amphibious assaults, and the Fifth Air Force commander, Lieutenant General George Kenney, preferred to cover amphibious assaults by attacking enemy air bases with his bombers and keeping his fighters on standby alert. By late 1943, however, the Army forces had become so proficient at the techniques of amphibious assault that they were able to effectively adapt the doctrine to better fit their particular circumstances.[106] MacArthur was able to "nudge"

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[105] Winnifield & Johnson, 35.

[106] American Way, 279-280.

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Kenney[107] into providing "two layers of air cover directly over the landing troops; eventually, the Fifth Air Force "became probably the best the best of AAF units in rendering tactical support for amphibious assaults."[108]

The evolution of the employment of air assets in the European theater also illustrates how interaction produces improvements in interoperability. At the beginning of the war, the Army ground forces saw aircraft as only a supporting arm. As such, they were apportioned piecemeal among the ground force commanders. The Air Corps and the Royal Air Force preferred centralization of air assets in order to improve the ability for decisive employment. As the North African campaign progressed, problems with the piecemeal approach led to concentration of Allied air assets under a single command. This allowed the air forces to establish air superiority with fighters while attacking enemy bases with bombers. Once this superiority had been established, attention would be given to close air support. Army Field Service Regulation 100-20 of 21 July 1943 codified this relationship by prohibiting the division of command of air assets unless they were "operating independently or are isolated by distance or lack of communication."[109]

Use of this structure, however, soon showed that the system was not responsive to the needs of ground commanders who might need air support to exploit success on the ground or assist in ground force defense. As a result, air-ground liaison units were developed. These units were assigned to ground units and

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[107] Daniel Barbey, MacArthur's Amphibious Navy: Seventh Amphibious Force Operations 1943-1945 (Annapolis: Naval Institute Press, 1969), 89, quoted in American Way, 280..

[108] American Way, 280.

[109] Allard, 107.

equipped with radios that enabled them to talk with the fighter-bombers that were supporting them. During the breakout from the Normandy invasion, the Ninth Tactical Air Command placed Air Support Parties in each division headquarters. Their ability to communicate with the close air support aircraft apportioned by 9th TAC headquarters "enabled both centralized control and decentralized execution of the operations."[110]

4. Operation Thor

Although there were many problems with joint operations in Vietnam, there were successes as well. One of these was Operation Thor, a joint operation undertaken in the summer of 1968 that neutralized North Vietnamese Army (NVA) artillery near the Demilitarized Zone for three years.[111]

In the spring of 1968, NVA artillery dominated the area south of the DMZ. They regularly shelled the supply lines in the area. Warships would not approach within 20 kilometers of the coast. No reconnaissance aircraft had flown over the region for several months.[112]

Provisional Corps Vietnam (PCV) Artillery created a plan to attack the NVA artillery in the region using a combination of artillery (both Army and Marine), naval gunfire, fighter-bombers, and B-52s, each of which had complementary capabilities

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[110] Allard, 108.

[111] Faris R. Kirkland, Lt. Col., USA (Ret), "Thor: A Case Study in Multi-Service Coordination," Field Artillery (February 1993), 11.

[112] Kirkland, 11.

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that could compensate for vulnerabilities of the others. The Air Force would not participate unless it controlled the operation. This dispute was not resolved and the plan was dropped.[113]

Intelligence reported that a two-division attack would occur in July. General William Westmoreland ordered that Operation Thor be executed starting on 7 July. To resolve the command issue, he directed that the Seventh Air Force would coordinate the first two days of the attack, which would largely consist of B-52 strikes. PCV would control the other five days of the action. Westmoreland committed a carrier air group, all naval gunfire support ships, 210 B-52 sorties, and 350 fighter-bomber sorties to reinforce the 3rd Marine Division and PCV artillery.[114]

Numerous interoperability problems could have made the operation impossible. The Air Force argued that incompatible navigation systems would preclude their participation; the Marines made changes that resolved the problem. The corps ammunition supply officer did not believe that the supply system could support the attack. PCV Artillery staff showed him how it could be done, and he developed a network of interested people in Air Force transport squadrons, Marine and Army truck units, and ammunition depots throughout Vietnam. When NVA artillery destroyed the ammunition dump where the Thor ammunition was being stockpiled, C-130s collected ammunition from locations throughout Vietnam and delivered it to trucks that took the ammunition directly to the batteries. Coordination between artillery and fighter-bombers was also a potential problem. None of the pilots was accustomed to having

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[113] Kirkland, 12-13.

[114] Kirkland, 12.

artillery for flak suppression, and they were initially hesitant about their safety. The artillery troops and the pilots met to discuss their concerns and worked out the details.[115]

Overall, Thor was a spectacular success. Naval gunfire and artillery were coordinated to protect bombers and reconnaissance aircraft. Nearly 100 NVA artillery weapons were destroyed. U.S. losses were one killed and one wounded. Interaction enabled resolution of incompatibilities of equipment and procedures and successful execution of an important mission with minimum losses.[116]

5. Lessons for Interoperability

In each of these cases, interaction provided two main benefits. First, interoperability problems were quickly identified. Personnel from each service examined the problems, discussed their reservations or lack of understanding concerning the equipment or procedures of the other services, and found solutions.

Second, interaction enabled members of each service to learn about their counterparts. The result of interaction was the development of trust between members of different services. As each learned the capabilities of the others, they began to rely on those capabilities, allowing the most effective use of available resources.

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[115] Kirkland, 14.

[116] Kirkland, 11.

B.   BENEFITS OF INCREASED ROUTINE INTERACTION

Many of the "successes" cited in this chapter occurred after the problems had been demonstrated in battle, at great cost in lives and resources. Once the services returned to their normal peacetime pattern of very limited interaction with the other services, the lessons learned during these operations were quickly lost. Increasing routine interaction will provide two main benefits for interoperability: testing hardware and doctrine compatibility and changing service culture.

1.   Validation of Doctrine and Hardware Compatibility

In 1986, the only joint doctrine publications were JCS Pub 1, <u>Dictionary of Military and Associated Terms</u>, and JCS Pub 2, <u>Unified Action Armed Forces</u>.[117] After the passage of GNA, the Joint Staff J-7 (Operational Plans and Interoperability) Directorate was founded, and the Joint Doctrine Center was established. Writing began on over 75 new joint publications;[118] the current joint publication system consists of 192 titles, about 130 of which are currently under development or revision.[119]

Joint Pub 1 states that doctrine "provides the distilled insights and wisdom gained from our collective experience with warfare."[120] For most of U.S. history, this has been exactly how joint procedures were developed: during actual warfare. Joint

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[117] Robert A. Doughty, Col. USA, "Reforming the Joint Doctrine Process," <u>Parameters</u> (Autumn 1992), 46-48.

[118] Doughty, 47.

[119] "Joint Doctrine Publications," <u>Joint Force Quarterly</u> 1 (Summer 1993), 112.

[120] Joint Pub 1, 5.

Pub 1 then says that this method must change: "we must . . . feed back to the doctrine process the lessons learned in training, exercises and operations; and ensure that Service doctrine and procedures are consistent."[121]

The lack of routine interaction has meant that hardware incompatibilities have only been detected during actual operations. Increased routine interaction between the services will serve to identify these problems in peacetime and permit resolution before they interfere with effective joint combat operations. Once solutions are developed, routine interaction allows them to be validated before they fact the test of combat.

2. Changing Service Culture

By definition, increased routine interaction will change the experiences of the services. The single-service assumptions of service cultures will become increasingly anachronistic. If service culture is an explanation of history, increased interaction will require cultural assumptions to change; interaction will become the norm rather than the exception. Such a change is especially important since past defense reorganizations show that service autonomy is unlikely to be reduced in the foreseeable future. Since the services will continue to procure and train their forces, improving interoperability will require that the service staffs believe that interoperablity is important and prepare their forces accordingly. Cultural change is the key to accomplishing what organizational change has not.

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[121] Joint Pub 1, 6.

C. MEANS TO PROMOTE INTEROPERABILITY

1. Exposure During Initial Training

Most new members of the military have little idea about how the armed forces operate. Basic training teaches recruits the skills that each service deems necessary to become part of the institution, including a sense of dedication to their country and their branch of service.[122] The information gained during initial training is especially important since people tend to pay more attention when forming initial impressions. After these impressions are formed, they tend to pay less attention to subsequent information, especially information that does not conform to their initial impressions.[123]

The implication of these ideas for interoperability is that a small amount of instruction about the capabilities of the other services and how the services interact shows new service members that interoperability is an important part of what their service does. While much of their time is spent learning service-specific tasks, instruction about interoperability puts the purpose for these skills in context. By contrast, new service members who have only been trained about their own service will continue to see single-service operations as the norm and be less prepared for joint operations in which they will participate.

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[122] James Shelburne and Kenneth Groves, Education in the Armed Forces (New York: Center for Applied Research in Education, 1965), 31-32.

[123] Ernest Hilgard, Rita Atkinson & Richard Atkinson, Introduction to Psychology (New York: Harcourt Brace Jovanovich, 1979), 533.

2. Joint Exercises

Joint exercises have become more frequent in recent years and funding of these exercises has held nearly steady despite defense cutbacks.[124] However, the minuscule budget for joint exercises, the need to develop and maintain service-specific skills, and the increased use of simulation during joint exercises[125] mean that joint exercises will continue to be a small part of routine operations. Since joint exercises will be relatively infrequent, the effects of joint exercises on service culture depends on previous conditioning concerning the importance of interoperability.

Without exposure to joint operational concepts during initial training, infrequent joint exercises are only an occasional interruption of the normal pattern of single-service operations. The infrequent joint exercises are not sufficient to promote the importance of interoperability, and service cultures based on single-service operations are preserved.

Personnel who are familiarized with joint operational concepts during initial training are conditioned to perceive joint operations as normal. Psychological studies have shown that even irregular, infrequent reinforcement is sufficient to preserve learned behaviors and attitudes,[126] so even the small number of joint exercises that most personnel will participate in will effectively reinforce the importance of interoperability.

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[124] 1992: CJCS Exercise Program $244.7 M, service funding for joint exercises $100.6 M; 1990: CJCS Exercise Program $218.8 M, service funding $103.6 M. James Kitfield, "United We Train," Government Executive (November 1992), 48.

[125] Kitfield, 49.

[126] Neil R. Carlson, Psychology: The Science of Behavior (Boston: Allyn and Bacon, 1990), 120.

A common criticism of joint exercises is that they are mainly command and control exercises for high level commanders.[127] This emphasis on upper echelon command and control problems also overshadows the validation of joint doctrine. It is not enough for the component commanders of a joint task force to be able to operate together; the units within those components must also be able to operate together. If the emphasis of a joint exercise is mainly on command and control of the overall effort, "two services participating in a joint exercise 'may actually just be exercising next to one another.'"[128]

One way to prevent this problem would be to conduct command and control exercises separately from interoperability exercises. Command and control exercises would involve commanders and staffs, making extensive use of simulation. These exercises would not waste the time of the operating forces, expend operating budgets, or risk environmental damage. In addition, the staffs would not have to wait while the units actually maneuvered, leaving more time to develop and practice means of command and staff interaction.[129]

Interoperability exercises would test how well joint doctrine enables actual units in the field to support one another. These would not be large scale exercises, nor would they be scenario driven. Command and staff participation would consist only of transmitting scripted messages and evaluating the performance of the

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[127] The Solid Shield exercises conducted by Atlantic Command before the Gulf War, for example, were nicknamed "Solid Waste." John Cushman, "Ocean Ventured, Something Gained," U.S. Naval Institute Proceedings (September 1992), 84.

[128] Capt. Robert Pacek, Joint Exercise Training Division, OJCS, quoted in Kitfield, 49.

[129] See, for example Cushman, "Ocean Ventured, Something Gained," 87.

commands involved; no operational or strategic decisions would be taken. If problems were found, the exercise could be stopped without disrupting the operations of thousands of other personnel engaged in other parts of the exercise. This would permit the participants to analyze the causes and propose solutions. The exercise could then be restarted at the appropriate point to test the effectiveness of those solutions.

The lower cost means of such exercises means that more of them could be conducted. Their improved focus and smaller scale means that the problems with joint operations would be more readily apparent and that solutions to these problems could be more easily achieved. A larger number of more focused exercises would reduce the perception that they were a waste of time with little relevance to actual operations. This will make the personnel involved likely to be more concerned with the results of joint exercises and more inclined to develop and suggest solutions to interoperability problems. Finally, service cultures, as explanations of their experiences, will begin to incorporate the importance of interoperability as service personnel internalize the idea that joint exercises are an important contributor to their missions.

3. Centralization and Standardization

Another way to improve interoperability is to centralize and standardize functions throughout the defense establishment. This will create a common frame of reference for all of the services which will make interaction seem normal. There are, however, certain service-unique functions which might be consolidated for the sake

of centralization, instead of improved military capability. This type of change pushes interaction faster than might be advisable, and will provoke resistance to other valid changes.

D.   JOINT OFFICER DEVELOPMENT

An important part of GNA is Title IV, Joint Officer Personnel Policies, which requires the Secretary of Defense to designate "joint specialty" officers, and to establish guidelines for their selection, education, training, and assignment. This has come to include designation of joint professional military education (JPME) curricula and timing within an officer's career, the establishment of a joint duty assignment list (JDAL) of billets that satisfy the requirements for joint duty, provisions concerning promotion rates of officers assigned to joint and unified staffs relative to their service contemporaries as a whole, and a requirement for officers selected to flag and general rank to have served in a joint duty billet.

Prospective joint specialty officers must first receive Joint Professional Military Education (JPME). They becomes JSOs after completing a joint duty assignment.[130] Congress specified that a JSO should be:

> an officer, expert in his own warfare specialty and service, who develops a deep understanding, broad knowledge, and keen appreciation of the integrated employment and support of all service capabilities in the pursuit of national objectives.[131]

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[130] JSO Guide, 1-18.

[131] U.S. Congress, House Armed Services Committee, Panel on Military Education Report, Report to the Committee on Armed Services, 101st Cong., 1st Sess., 21 April 1989, 56.

GNA does not allow officers to receive credit for JPME until they reach O-4 and DoD does not permit O-3s and below from receiving joint duty credit, since junior officers supposedly have not become experts in their own services, so they cannot be ready to adopt a joint perspective.[132]

Waiting until intermediate JPME to introduce officers to joint operational concepts inhibits the cultural changes necessary to promote interoperability. It ignores the primacy effect and sacrifices the opportunity to establish a joint perspective that JPME could build on.

Officers whose initial training includes joint concepts and whose operational experience included even infrequent joint exercises and operations would see JPME as a further reinforcement of their experiences. JPME would then be able to begin with more advanced instruction on joint concepts. Subsequent tours as a JSO would be valued opportunities to improve interoperability.

Officers without initial exposure to joint concepts will maintain single-service perspectives that infrequent exposure to joint operations are unlikely to extinguish. As a result, part of JPME will be spent extinguishing single-service perspectives. Worse yet, many of these officers will continue to see JPME and joint duty as tickets to be punched. These officers may never truly develop a joint perspective and will, therefore, be less effective in their joint duty assignments. This would clearly violate the intent of GNA and would reduce the effectiveness of the armed forces.

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[132] Panel on Military Education Report, 14.

Finally, many officers will never receive JPME or serve in joint duty assignments, and many of these will serve on the service staffs that procure equipment and make decisions on doctrine and training. If JPME is where officers are supposed to develop joint perspectives, then officers who do not receive JPME may never do so. With their single-service perspectives, they will continue to downplay the importance of interoperability in their planning. As a result, interoperability problems that service planners with joint perspectives might have prevented will continue to plague the operating forces, as inconveniences during joint exercises, or as tragedies during joint combat operations.

V. WHITHER INTEROPERABILITY?

Although none of the reorganizations have altered the systemic problems that impede interoperability, the importance of interoperability and the need for more frequent interaction appear to have been finally recognized. This chapter analyzes recent events and initiatives to determine if they increase routine interaction between the services and how they might emphasize the importance of interoperability. The thesis concludes with observations concerning the future of efforts to improve interoperability.

A. ANALYSIS OF RECENT EVENTS

1. 1993 Chairman, Joint Chiefs of Staff, Roles, Missions and Functions Report

Required every three years by GNA, this report contains numerous proposals that would increase interaction between the services. Just as importantly, the report noted that many suggested changes would not produce significant cost savings or improvements in military effectiveness and did not recommend them. This resistance to change for its own sake is important, as long as it is motivated by military effectiveness and not the desire to keep traditional capabilities which are no longer required.

The report proposed assigning Commander in Chief, Atlantic Command as the unified commander for U.S. based forces. This is useful, as far as it goes. Many U.S. based forces would not be included in this command, including Air Mobility

Command and West Coast Navy and Marine Corps units. LANTCOM would develop and exercise joint doctrine.[133] However, the frequency of joint exercises remains to be seen.

The report also suggests several consolidations and standardizations throughout the defense establishment. Among these are depot maintenance, flight training, methods of determining aircraft requirements and inventory, test and evaluation facilities, and initial skills training.[134] All of these would increase interaction or create common systems, producing common experiences that enhance interoperability.

2. Ocean Venture and Tandem Thrust

Ocean Venture and Tandem Thrust, conducted by Atlantic Command and Pacific Command respectively, are annual exercises to improve interoperability. Tandem Thrust 92 included an electronic transmission of a Joint Forces Air Component Command (JFACC) Air Tasking Order (ATO).[135] During Ocean Venture 92, the naval component commander operated from the joint force commander's (JFC) land-based headquarters, making him available to consult with the JFC throughout the operation.[136] Ocean Venture 93 stationed the JFC at sea, with subsequent transfer

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[133] Chairman, Joint Chiefs of Staff, Report on the Roles, Missions, and Functions of the Armed Forces of the United States (Washington: Department of Defense, 1993), x and III-5. Hereafter cited as Roles, Missions and Functions.

[134] Roles, Missions and Functions, III-5,9,20,21,43,47.

[135] Roles, Missions and Functions, II-19.

[136] Cushman, 83.

to a land-based command center.[137] During Tandem Thrust 93, JFACC was transferred from USS Blue Ridge to 13th Air Force Headquarters in Guam.[138] These exercises continue to familiarize personnel with the capabilities of the other services. As large scale exercises, however, they are mainly command and control exercises that do not necessarily test joint doctrine.

3.   United States Special Operations Command

In addition to being a motivating factor for GNA, the tragedy at Desert One triggered congressional action concerning the organization of the Special Operations Forces (SOF). SOF had been deemphasized by service leaders whose cultural assumptions discounted its importance. After Desert One, Congressional SOF supporters increased the SOF budget from $440 million in 1981 to $1.1 billion in 1986. Although this improved the readiness of SOF, "[joint] command and control remained unimproved despite the . . . creation of the Joint Special Operations Agency,"[139] largely because the JSOA was only an advisory body without any authority over SOF.[140] Procurement of SOF-specific equipment was also a chronic problem. The services funded the forces they saw as necessary to face the Soviet threat, which did not always include SOF. In addition, funding for SOF was difficult to separate from other funds, hampering efforts to improve SOF by increasing its funding.

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[137] Jon P. Walman, "Joint force exercises: Coming from the sea," Surface Warfare (July/August 1993), 2-3.

[138] C.R. Rondestvedt, "Putting the JFACC to the Test," Proceedings (January 1994), 61.

[139] R. Lynn Rylander, "ASD-SOLIC: The Congressional Approach to SOF Reorgainzation," Special Warfare (Spring 1989), 12.

[140] James B. Motley, Col., USA (Ret.), "Big Tug-of-War Over Special Operations Forces," Army (November 1986), 22.

other funds, hampering efforts to improve SOF by increasing its funding.

By 1986, Congress decided that structural reform was needed to ensure that SOF would receive the attention it deserved. Its solution was the creation of the U.S. Special Operations Command (USSOCOM) as a unified command. This supporting CINC would command all SOF, which would be deployed as component commands under each theater CINC.[141] Even after the passage of GNA, USSOCOM would have been no different than other unified commands if it also consisted of service component commands that were funded by their parent services as those services saw fit. The separate service cultures, none of which emphasized SOF, would continue to neglect SOF, thereby defeating the reason for establishing USSOCOM.

But Congress did not simply superimpose another layer of command structure. USSOCOM has two distinctive features that separate it from other unified commands. First, it is a functional, as opposed to a geographical, command that consists solely of special operations personnel.[142] In effect, this has changed the culture of the organization that controls SOF, since the service staffs no longer control programming decisions for SOF-specific equipment and training. Second, Congress created Major Force Program 11 to consolidate SOF-specific programs, and gave control of MFP 11 to USCINCSOC.[143] This gave USSOCOM the budgetary autonomy to fund programs that SOF professionals thought necessary, rather than having

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[141] Rylander, 14.

[142] James J. Lindsay, Gen. USA, "USSOCOM: Strengthening the SOF Capability," Special Warfare (Spring 1989), 4.

[143] Lindsay, 5.

service staffs, most of whose members have no SOF experience, determine what SOF programs would be funded. A "cultural change" occured that eliminated the need to reduce "service" autonomy.

USSOCOM prepared its first budget in 1991 for the FY 1992-97 FYDP. Its budget has held nearly steady at about $3 billion for FY 1992 through 1994. Among the programs that have finally been funded and have entered production are the MC-130H Combat Talon II aircraft and the MH-53J Pavelow helicopter, both of which had been stymied by the Air Force since the early 1980s, and the Cyclone-class patrol combatants.[144] These programs, and many other smaller ones, were planned by staffs whose cultural assumptions appreciate the capabilities of SOF and whose budget authority permits that vision to be executed. Although interoperability is a stated mission of USSOCOM,[145] the main lesson for this thesis is that cultural change can produce a desired change without the need to reduce statutory autonomy.

4. Joint "Center of Excellence"

In the past two years, Norfolk, Virginia, has become the "undisputed capital of doctrinal development." Most of the joint, interservice and service doctrinal development centers are located in the Norfolk area, including the Naval Doctrine Center, the Air Force Doctrine Center, the Army Training and Doctrine Command, the Air Land Sea Application Center, and the Joint Doctrine Center (which will be absorbed by the recently announced Joint Warfighting Center, also to be located in

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[144] U.S. Special Operations Forces Posture Statement 1993, (Washington: Department of Defense (Assistant Secretary of Defense (Special Operations / Low Intensity Conflict))), 28-29.

[145] Lindsay, 9.

Norfolk).[146] The Naval Doctrine Center is staffed by both Navy and Marine personnel and is responsible to both the CNO and the Commandant of the Marine Corps.[147] The Air Land Sea Development Center is tasked with promote interoperability among the services.[148] The functions of the new Joint Warfighting Center are to:

- Facilitate the joint doctrine development process and provide a focal point for the consideration of emerging warfighting concepts.

- Provide core expertise to assist in the planning, execution, and assessment of joint exercises and training activities.[149]

The proximity of these centers promotes routine interaction, enhancing the importance of interoperability, and facilitates revision of both service and joint doctrine as lessons are learned from joint exercises and operations.

The development and refinement of joint doctrine will also be enhanced by the location of U.S. Atlantic Command headquarters in Norfolk. The Secretary of Defense accepted the recommendation of CJCS to place Forces Command, Air Combat Command, Atlantic Fleet, and Marine Forces Atlantic under a single combat command. Although the services retain their statutory responsibilities for these component commands, Atlantic Command will be "responsible for joint training, force packaging, and deployment in crises [in order] to ensure that deploying forces are

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[146] "Eye on Norfolk," Joint Force Quarterly (Summer 1993), 112.

[147] Frederick Lewis, "Naval Doctrine Center," Joint Force Quarterly (Autumn 1993), 115.

[148] "The Air Land Sea Bulletin," Joint Force Quarterly (Summer 1993), 112.

[149] Bill Graham, "Joint Warfighting Center," Joint Force Quarterly (Autumn 1993), 112.

ready on arrival for joint operations."[150] As if to emphasize the joint nature of this new structure, the previous acronym for Atlantic Command, LANTCOM, has been replaced by "USACOM" in October 1993.[151]   If budgets support the desired level of joint exercises, joint doctrine and interoperability can be refined and incorporated by the forces of the other unified commands. As these forces operate more frequently with the other services, the service cultures will change to accept the importance of interoperability.

5.   Political Factors

Several political factors could affect the cultural changes needed to enhance interoperability. Reduced budgets make it difficult to add training on joint concepts to initial training or service-specific courses. Although the administration has pledged to maintain training and readiness of operating forces at "prior-year levels,"[152] training courses are being shortened or eliminated.[153]   Not adding this material jeopardizes the cultural changes needed to enhance the importance of interoperability. On the positive side, however, are courses that teach common skills. Consolidating these courses reduces costs while providing interaction. Many of these courses have

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[150] Paul David Miller, "A New Mission for Atlantic Command," Joint Force Quarterly (Summer 1993), 81-82.

[151] Norman Polmar, "The Newest -- And Largest -- Command," U.S. Naval Institute Proceedings (February 1994), 89.

[152] Les Aspin, "The First Post-Cold War Defense Program," Defense 93 2: 5.

[153] For example, the Tactical Action Officer course for non-surface warfare officers assigned to ship's company is being eliminated, and the Surface Warfare Department Head Course is being shortened from 26 to 24 weeks.

already been consolidated,[154] and the services have formed the Interservice Training Review Organization to determine which training courses are amenable to consolidation.[155]

Another budgetary constraint is the availability of forces and funds for joint exercises, especially interoperability exercises. Although the "operating tempo and training rates" of the armed forces are being maintained at previous levels,[156] the number of forces available for deployment is decreasing. Commitments, however, are not being reduced at the same rate. This reduces training time, which hampers improvements to joint doctrine and interoperability and reduces interaction between the services during their training for deployment, since this training will have to focus increasingly on service-specific skills.

A final political factor is Congressional activism. A main motivating factor for each defense reorganization was the perception that the services were more interested in preserving their autonomy than in ensuring the most effective fighting force. Since the services seemed to be unwilling to cooperate to ensure joint effectiveness, organizational changes were imposed to force the services to do so.

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[154] The Army trains all Marine artillery, armor, combat engineer, and unmanned aerial vehicle personnel, as well as all military police. The Air Force trains all WWMCCS operators, imagery interpreters, and military police working dog handlers. The Navy trains all cryptological personnel. DoD operates the Defense Mapping School and the Defense Intelligence College. Aviation training is being consolidated, as previously discussed. Roles, Missions and Functions, II-20 thru II-21.

[155] Roles, Missions and Functions, III-47.

[156] Aspin, 5.

In recent years, however, this attitude has changed. Countless articles have appeared in military journals concerning joint operations. The service leadership constantly emphasizes the importance of interoperability. As a result, congressional interest has begun to wane, questions about "four air forces" or "two armies" notwithstanding. If the services appear to be making good faith efforts to resolve such issues, Congress appears to be less inclined to interfere. The emphasis of the Clinton administration on domestic issues encourages Congress to pay less attention to military operations. Health care and welfare are much more attractive issues for substantive debate, while debate on military spending is more in terms of how much discretionary spending can be cut.

B. CONCLUSIONS

The services have been independent since the establishment of separate departments in 1798. Despite several defense reorganizations, the individual services are still responsible for providing and training their own forces. Their decisions about what forces to procure and how to train them are based on their differing views of what the forces are for. The unified commanders operate the deployed forces, but the individual services procure and train them. The Chairman of the Joint Chiefs of Staff is the principal military advisor to the National Command Authority and issues the National Military Strategy, but each of the services separately interpret the strategy and devise the means by which they will carry it out. Even though these proposals must be approved by OSD, the final product reflects the assumptions of each of the services, which are products of their individual philosophies.

The independent traditions of the services continue to influence the training of military personnel. Since there is no tradition of interoperability, familiarity with other services is not emphasized. Since personnel of one service are largely ignorant of what the others do, they do not consider the other services in their planning. Since operating with other services has not been a traditional mission, it is not emphasized in unit training. Accordingly, the services provide forces that are fully capable of performing the individual missions for which they have prepared, but less able to operate with forces from other services. The forces are not interoperable because they were not designed or trained with interoperability in mind.

The key to improving interoperability is making the services interact at all levels on a routine basis. Joint command structures and high level oversight are fine as far as they go. But until the members of the different services operate together on a routine basis, joint operations will be seen as exceptional and interoperability will not be an important consideration in the services' planning.

The armed forces are making progress in enhancing interoperability. Desert Storm was an effective joint operation despite problems with co-location of component commanders and with the air tasking order, and these problems have been addressed in subsequent joint exercises. The steps recommended in the 1993 CJCS Roles, Missions and Functions Report are useful changes, instead of change for its own sake. These changes are certainly slower and less revolutionary than some might want. Radical steps could be taken, but would face more opposition than gradually increased interaction. Gradually increased interaction will cause a cultural change that

will internalize the importance of interoperability. When this has occurred, personnel will seek ways to improve coordination of joint operations, instead of simply enduring joint exercises until they can return to their "normal" missions.

Fortunately, there are no credible military threats or political demands that require rapid, and therefore less effective, changes to improve interoperability. Changing attitudes takes exposure and time. After all, it took 200 years to develop non-interoperable forces; Goldwater-Nichols was only passed eight years ago.

Ironically, a danger to improving interoperability is the declining defense budget. While a smaller force structure would seem to require the forces to be able to operate together, smaller budgets are threatening training and exercise funding. Training budgets are already being reduced; increasing training on joint capabilities will require sacrificing something else. Joint exercises are expensive and are funded by the same account as operational commitments, which have not been reduced in accordance with lower budgets and shrinking force levels. The result might be less initial exposure to interoperability, and fewer officers receiving operational reinforcement of the importance of interoperability. This would erode the cultural change that is required to ensure effective interoperability. Fewer joint exercises would also slow the pace of improving joint doctrine and detecting equipment barriers to interoperability.

The future of U.S. defense strategy is focused on joint operations. These operations will require interoperable forces. The six months used to prepare for Desert Storm and the lack of opposition to Provide Comfort and Restore Hope cannot be relied upon in the future. The forces must be equipped and trained with interoperability in mind, so they will be ready to immediately commence joint action.

The military and civilian leadership of the defense establishment must exhibit strong leadership to make the changes needed to enhance interoperability and to ensure that the required programs are adequately funded.

This thesis provides a new perspective to explain past interoperability problems and provides ideas to enhance the importance of interoperability in military planning and operations. Hopefully, it can contribute to the formation of a new paradigm concerning how the services should interact. Interoperability is a vital contributor to the effective defense of national interests. The key to improving interoperability lies in increasing interaction rather than imposing command structures; the solution must treat the cause, not the symptom.

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